

*PERSONAL  
COMPUTER*

# pineapple™



pineapple<sup>VR</sup>



## OPERATION MANUAL

Scanned by [cvxmelo](#)  
With thanks to [Scott Elyard](#)

# A REFERENCE MANUAL FOR PINEAPPLE COMPUTER

**PERSONAL COMPUTER**

---

**pineapple™**

- 1 INTRODUCTION**
- 2 OUTLOOK**
- 3 OPERATION**
- 4 COMPONENT LAYOUT**
- 5 COMPONENT INSERTION GUIDE**
- 6 EXPLODED VIEW**
- 7 TROUBLE SHOOTING**

## **CONTENTS**

---

Welcome to join our Pineapple party. This book will show you how to operate your Pineapple II computer and will be a guide as your study to program it, you will find a lot of fun in the Pineapple. Actually, you will find many features and conveniences in the BASIC that make programming more interesting. If you are a new comer, be warned that programming though not difficult, can only be learnt by **DOING**. we will discuss this topic later.

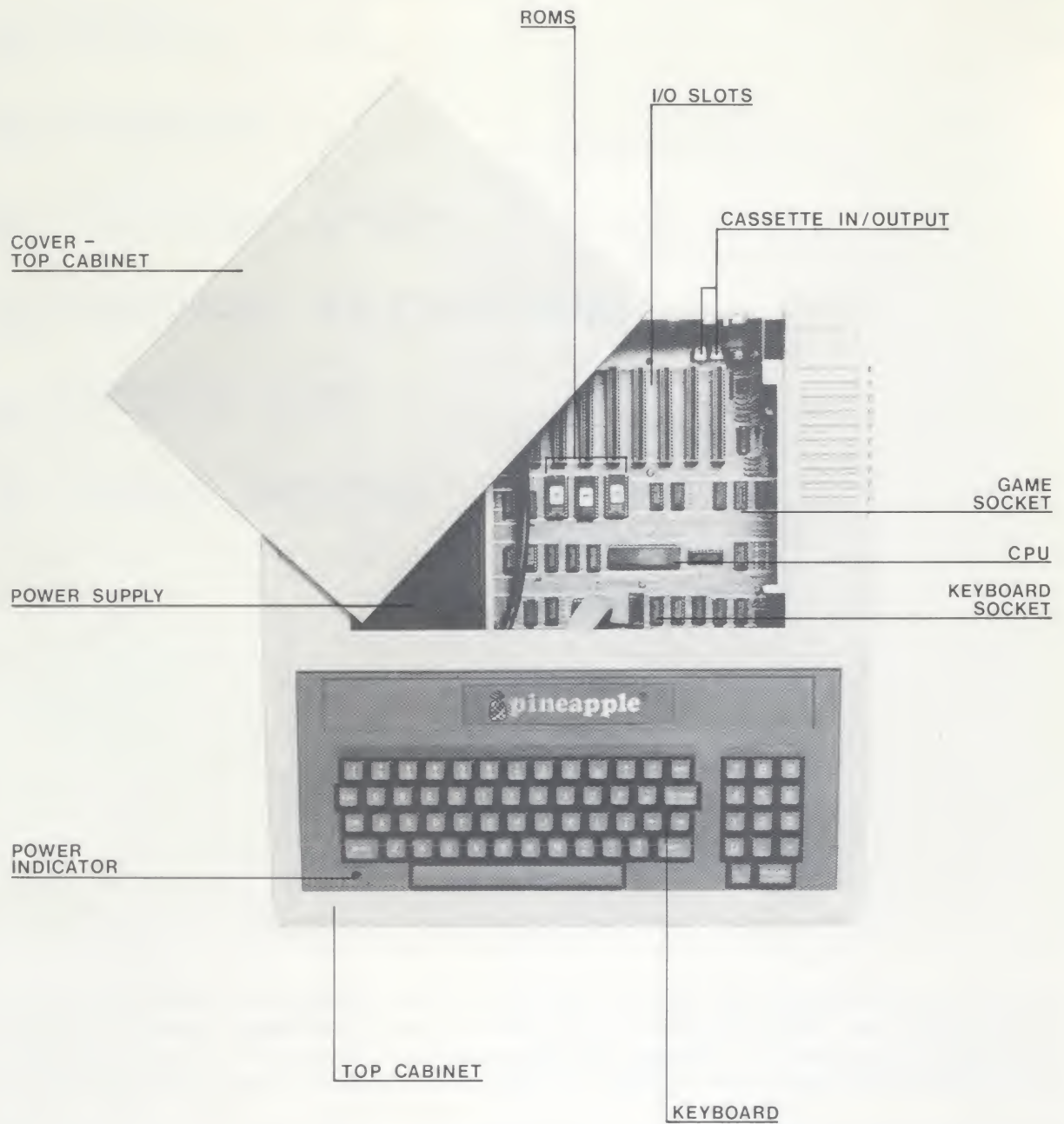
If you purchase your Pineapple from an authorized Pineapple dealer, the dealer will be willing to let you set your Pineapple up in the shop to make sure you know how to set it up at home. If you received it as a gift or through the mail, it is not difficult to hook technical knowledge is needed at all.

The Pineapple described in this manual has the **BASIC** computer language and the Autostart ROM installed on the main board.

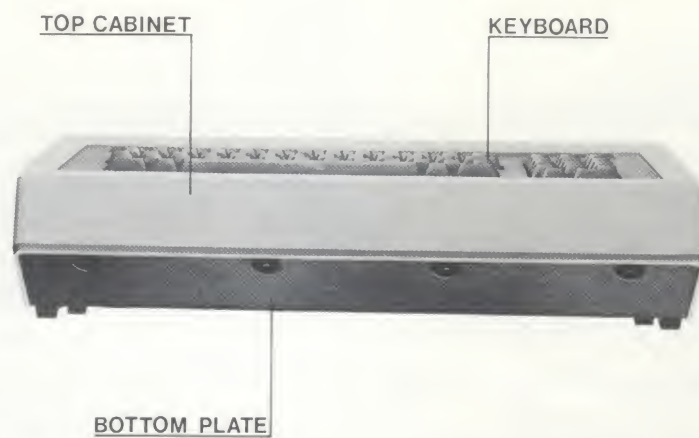
# **INTRODUCTION**

---

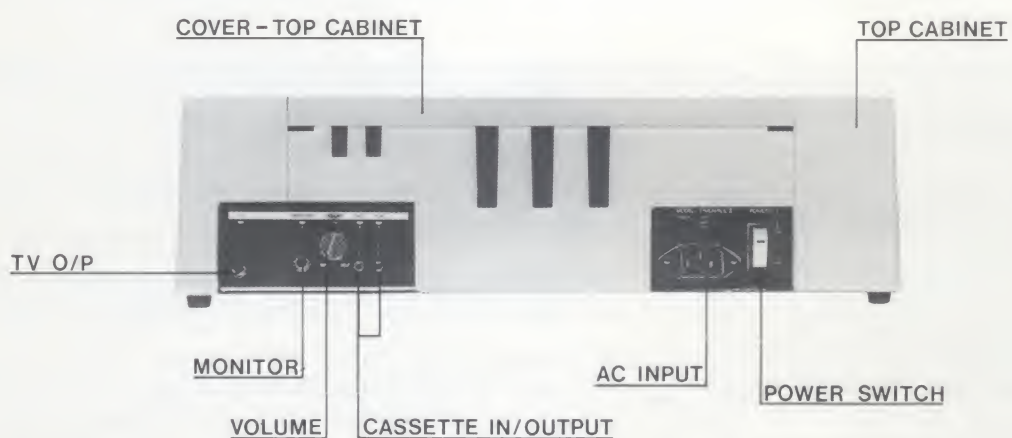




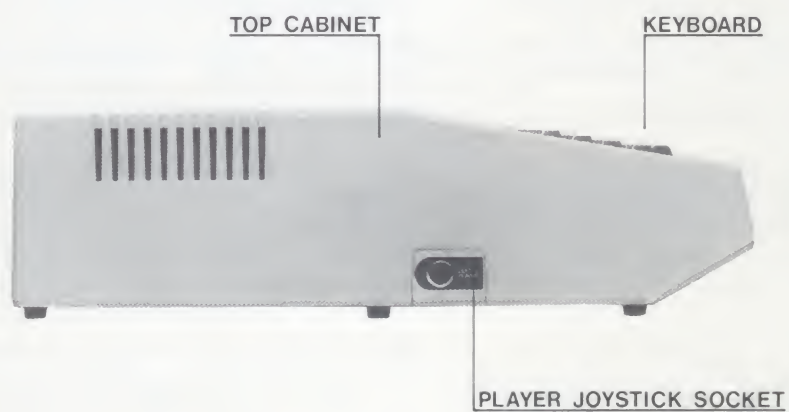
PLAN ELEVATION



## FRONT ELEVATION



## REAR ELEVATION



## SIDE ELEVATION

## WHAT YOU WILL NEED

This manual was in the accessory box. This box should also contain the power cord (the cord that plug into the outlet on the wall).

In addition to the Pineapple II itself and the contents of the accessory box, you will need two more items chosen from the options below (none of these items are supplied).

1. You will need one of the following items (it's useful to have both, but only one is necessary).
  - a. A cassette recorder and a cable to connect it to the Pineapple.OR
  - b. The DISK II disk drive with a controller card.
2. You will also need one of the following items:
  - a. A color TV monitor and a cable that has a phono plug (also called a male RCA-type connector) at one end and something to match the monitor at the other end. The dealer that sells you the monitor can supply the cable.OR
  - b. An ordinary home color TV and an "RF Modulator" with the connecting cables. The RF Modulator changes the signal output by the Pineapple so that it matches what your TV expects. A number of Modulators are available. The Modulator comes with instructions on how to hook it up. Your TV's ability to receive normal programs will not be diminished (or enhanced) by having the Pineapple hooked up to it. A black and white monitor or TV will work fine, but will not let you take advantage of Pineapple's ability to generate color pictures. Colors described in this manual will appear as different shades of grey on a black and white monitor or TV.

NOTE: The Pineapple II computer may only be connected to a standard TV receiver through an RF Modulator.

## HOOKING UP THE TV

If you have a color (or black and white) monitor, just connect the appropriate cable from the jack marked **VIDEO OUT** (on the rear of the Pineapple) to the input of the monitor.

If you have an ordinary TV, you will have to install an RF Modulator. Open the top of the Pineapple by pulling straight up on the back of the lid using both hands, one on each side. Then install the modulator following the directions that come with it.

## PLUGGING IN THE GAME CONTROLLERS

With the lid open, plug the controllers' rather delicate plug into the **GAME I/O** socket located in the right-rear corner (front view) of the Pineapple board. Be very careful and make sure that all the pins go into the socket. The plug's white dot should be toward the front (keyboard end) of the computer.

## THE DISK II

If you have a disk drive, unpack it carefully. Then read the preface and the first chapter of the Disk Operating System (usually called DOS) manual that came in the Disk II package. Those pages will give you complete instructions on how to set up your disk drive.

## THE CASSETTE RECORDER

(if you are not using a disk drive, or  
if you are going to use both recorder and disk)



Use the supplied cable (the one with two plugs on each end) to connect the Pineapple to your cassette tape recorder. Connect one black plug to the **MIC** or **MICROPHONE** jack on the recorder, and the other black plug (on the opposite end of the cable) to the jack on the back of the computer marked **CASSETTE OUT**. Connect the grey plug on the recorder end of the cable to the recorder's **EAR** or **EARPHONE** or **MON** or **MONITOR** jack on the recorder (different brands use different words). Connect the grey plug on the computer end of the cable to the jack marked **CASSETTE IN**. "OUT" means "out of the computer" and "IN" means "into the computer." All that remains is to plug the cassette recorder's power cord into a wall outlet, and it will be ready to use.

Now close the top of the Pineapple. Plug the Pineapple end of the computer's power cord into the Pineapple (on the rear of the Pineapple, next to the power switch), and the other end into a three-prong grounded wall outlet. Now the Pineapple is completely set up, and you have only to read on to begin exploring the fascinating world of personal computing.

## THE PINEAPPLE KEYBOARD

The first thing to do, now that all the connections have been made, is to turn the Pineapple on. The switch is on the back of the computer next to where the power cord plugs in. Push it into the upward position. You will be rewarded by the "POWER" light at the bottom of the keyboard coming on. The POWER light is not a key, and cannot be depressed. The title "PINEAPPLE" should also appear at the top of the screen along with a ] and a blinking square called the "cursor" to the far left.

If your Pineapple doesn't seem to be responding correctly to your instructions (you'll find out what correct responses are as you become familiar with this manual), a press of the **RESET** key will usually remedy the problem. If that doesn't work, turning the Pineapple off and then turning it back on again will probably do the trick.

If you have a disk drive, turning your Pineapple on will give the following results. A few clacking noises will come from it, followed by a soft whirring sound, and a red light labelled "IN USE" will come on. The disk drive will whirl and whirl until it seems that it will never stop. As a matter of fact, it won't: until you stop it by pressing the **CTRL RESET** key. Do that now. The title "PINEAPPLE" disappears, and the prompt and cursor appear at the bottom left of the screen.

Study the keyboard. If you are familiar with standard typewriters, you will find a few differences between the Pineapple keyboard and a typewriter keyboard. First, there are no lower case letters. You can get only capital letters on the Pineapple and one set of numerical key on right side, it works like a calculator.

Using the diagram, locate the two **SHIFT** keys on the keyboard. The reason the keyboard has the **SHIFT** keys is to allow for nearly twice as many characters with the same number of keys. A keyboard with a separate key for each character would be very large, making it hard to find any desired key.

If you press a key which has two symbols on it, the lower symbol will appear on the screen. If you press the same key while holding down either of the **SHIFT** keys, the upper symbol will appear on the screen. You will find that the **SHIFTed** comma and the **SHIFTed** period are (and) respectively. You will also find other symbols on the Pineapple keyboard that are not on a standard Typewriter. Feel free to try operating any of these keys.

If there is no upper symbol on a key, then holding down the **SHIFT** while the key is pressed has no effect.

An important difference between using the Pineapple keyboard and most typewriters is that you cannot employ a lower case "L" for the number "1". Of course, there is no lower case "L" on the Pineapple, but some typists will have to break the habit of reaching for the letter "L" when they mean the number "1".

When the Hindu mathematicians invented the open circle for the numeral zero, they didn't use the Roman alphabet. So they chose a symbol that, while not conflicting with **THEIR** alphabet, looks just like our letter "O". The computer (and any straight-thinking individual) will want to keep zeros and oh's distinct. The usual method for doing this, on the Pineapple and many other computers, is to put a slash through the zero. Now you can tell them apart. The keyboard and the **TV** display both make the distinction clear. Try them.

After a bit of typing, the screen tends to get full of stuff. To clear the screen, you need to use the key marked **ESC** stands for the word "ESCAPE." The **ESC** key does not show up on the Pineapple's screen. Press **ESC**, and pressing the key marked "P". Notice that the **ESC** key, unlike the **SHIFT** key, does not need to be held down while typing another key. You have to operate three keys to clear the screen. First press **ESC** and release it. Then, while holding down **SHIFT**, press **P**. Instant gratification: the contents of the screen promptly disappear.

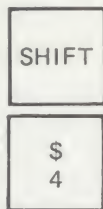


## KEYBOARD NOTATION

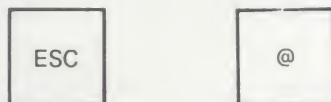
At this point we will introduce a simple notation.

As you have seen, when a key is to be pressed, such as the key for the letter "P", that key's symbol will be shown: P. To indicate pressing several keys in succession, we will simply list the keys in the order to be pressed: **PINEAPPLE**

On occasion, you will need to hold down one key while pressing another key. For example, to type a dollar-sign (\$) you must hold down the **SHIFT** key while you press the 4 key. Whenever this dual action is required, we will show that symbols for both keys, one above the other.



The upper key is to be held down while the lower key is pressed. Here's how to clear the screen, using the new notation:

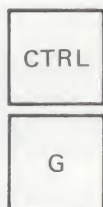


Try it.

## CONTROL, AND OTHER UNSAVORY CHARACTERS

When you press the 3 key, the numeral 3 appears on the TV screen. You probably believe this is true, but try it anyway. If you hold the **SHIFT** key down while pressing the 3 key, a number sign (#) should appear on the screen. Does it? The **SHIFT** key permits some of the keys on the keyboard to have two different functions. Several of the keys also have a third function. The third function is obtained by holding the **CTRL** key down while other keys are pressed. "**CTRL**" stands for the word "**ConTRol**." Instead of putting new characters on the screen when you use the **CTRL** key, the computer responds by performing certain actions. Control characters never appear on the screen.

Hold the **CTRL** key down and press G



It doesn't go "ding", but it does go "beep." Whenever the computer wishes to call your attention to something, it will sound the beeper. **CTRL G** is called "**BELL**" for historical reasons: the present Keyboard design is based on that of the Teletype. On that venerable machine, **CTRL G** rings a real bell.

There is also a key marked **RETURN** on the keyboard. On machines in the past, this was the "carriage return" key. On the Pineapple, it causes the blinking cursor to "return" to the screen's left edge, but it is also a special message to the computer. More about this message later. If you happen to press **RETURN**, you will sometimes get a "beep" and the message

?SYNTAX ERROR

will appear on the screen. For the time being, ignore this message.

The only keys left unmentioned are the ← and → keys. They move the cursor to the left and the right. They will be explained more fully later. Test out these keys and any others you can find. There is nothing you can do by typing at the keyboard that can cause any damage to the computer. Unless you type with a hammer. So feel free to experiment. With you fingers.

## SETTING THE TAPE RECORDER

(if you are not using a cassette recorder, skip to the section called "USING A DISK DRIVE".)

Now press the **RETURN** key. The right hand square bracket **)** and the blinking cursor that show on the screen's left edge let you know that you are "in Floating Point BASIC" or have Floating Point BASIC "up" (as they say). Now you are ready to set the volume control on the tape recorder.

When you play a tape recorder, it is usually with the intent of making sounds that you can hear. If it is too soft, you miss some of the words or music. If it is too loud, it is annoying.

When you play the tape recorder into the Pineapple, it is with the intent of putting the tape's information into the computer. If the volume setting is too soft, the Pineapple will miss some of the information, and it will complain by giving an error message. If the volume setting is too loud, the Pineapple will also complain.

To find the right volume setting, you will use a trial-and-error method. You will play an Floating Point BASIC tape softly to the computer and see if the information got in OK. If it doesn't work, you will try the tape again, a little louder this time. If that doesn't work, you will make it a little louder still. Eventually the volume will be just right for the Pineapple, and it will say so with a beep.

To clear the screen for action type



Place the tape marked **COLOR DEMOSOFT** into your recorder. For each position of the volume control you are going to do the following:

1. Rewinding the tape to the beginning.
2. Start the tape playing.
3. Type:

### LOAD RETURN

When you do this, the cursor will disappear. It may take up to 15 seconds before something happens. There are these possibilities:

- a. The message **?SYNTAX ERROR** appears.
- b. Nothing at all happens.
- c. The message **ERR** or **ERRERR** appears (with or without a beep).
- d. The computer goes "beep" and nothing appears.

In case a, do not reset the volume control, but go back to step 1 where you rewind the tape.

In cases b and c, make sure you waited for 15 seconds before giving up. If there is no prompt character or cursor, and the Pineapple does not respond to its keyboard, press **RESET**, set the volume control a bit higher and go back to step 1. Once in a great while the **LOAD** command may not work properly, and the cursor will appear on the screen immediately without waiting for the tape to be **LOADed**. If this happens just turn your Pineapple off and then on again with the power switch on the rear of the computer, and then try **LOADing** the tape again.



In case d, you are on the right track. When you hear the beep, wait another fifteen seconds. Either you will get an error message (case c), or the prompt character (]) and the blinking cursor will reappear. If they do reappear, stop and rewind the tape. Mark the position of the recorder's volume control, so that you can use this setting each time you **LOAD** a tape in the future. Then type

## RUN RETURN

The screen should look like this:

## THE USUAL PROCEDURE FOR LOADING TAPES

(once the recorder's volume control has been set correctly)

1. Rewind the tape.
2. Start the tape playing.
3. Type **LOAD**

After you press **RETURN** the cursor will disappear. Nothing happens from 5 to 20 seconds, and then the Pineapple beeps. This means that the tape's information has started to go into the computer. After some more time (depending on how much information was on the tape, but usually less than a few minutes) the Pineapple beeps again and the prompt character and the cursor reappear.

4. Stop the tape recorder and rewind the tape. The information has been transferred, and you are finished with the tape recorder for the time being.
5. Type **RUN** and press **RETURN**, and your program will begin to execute.

If your Pineapple is in the Floating Point BASIC computer language, the tape you are **LOADing** must be in Floating Point BASIC too. Trying to **LOAD** a tape in the wrong computer language gives results that are pretty much unpredictable. Strange error messages and odd characters may appear on your TV screen, you may lose keyboard control, or any number of other odd things can happen. If this happens to you, turn your Pineapple off and then back on again to get everything back to normal.

Computerniks use many different words to describe the process of taking information from a tape and putting the information into the computer. The computer is said to "read" (pronounced "read") the tape, The information on the tape is said to be "entered" or "read" (pronounced "red") into the computer. The act of reading a tape is also called "loading" a tape into the computer and the information on the tape is said to be "loaded into" the computer. All these expressions are ways of saying the same thing.

## A HELPFUL HINT

What is it that the computer finds so interesting about these tapes? Listen to one of them. It's not music to your ears. Yet you can recognize some of the sounds the computer listens for. The information starts with a steady tone. Then there is a short "blip" followed by more of the steady tone. The tone is at 1000 cycles per second. This pitch is just below the C two octaves above middle C. After the tone comes a burst of sound rather reminiscent of a rainstorm.

When you are used to the sound of a good tape, you can quickly check a tape by ear to see if it is a computer tape or not. If you can tell what the tape contains by listening to it, you are a mutant, and will go far in the computer world.

## USING A DISK DRIVE

(Skip this section if you are not using a disk drive.)

A disk drive is much quicker and easier to use than a cassette recorder, however, diskettes and disk drives are delicate creatures, and some care must be taken to protect them. You will find information of their care and feeding on pages 5 through 6 in your DOS manual in the section called **CARE OF THE DISK II AND DISKETTES**. Read that section carefully if you haven't already.



The last section in the first chapter of the DOS manual is called **INSERTING AND REMOVING DISKETTES**. Get the System Master diskette from its package and insert it with the label facing up and the oval cutout toward the back of the disk drive, as described in the DOS manual.

One of the features that make the Disk II so easy to use is its ability to store and retrieve several different groups of information. The groups of information are filed on the disk under names called file names. A program that keeps track of addresses, for instance, might be called **ADDRESSES** on the diskette.

The programs that keep track of files, save and retrieve them, and do lots of other housekeeping tasks are what make up the **Disk Operating System of DOS**. The process of adding the DOS capabilities to Floating Point **BASIC** (or to any other language used by your Pineapple) is called "booting DOS" or "booting the system".

There are several ways to boot **DOS**. One way is to simply turn your Pineapple off and turn it on again. The Disk drive's red "**IN USE**" light will come on again, and the Disk II will make the same whirring and clacking noises it made when the Pineapple was turned on for the first time. This time the disk drive will stop whirring on its own. When the whirring stops and the red light goes off, the title Pineapple will disappear and a message will come on the screen.

When you get this message, you know that DOS is booted. The right-hand square bracket and the blinking cursor that appear at the bottom left corner of the screen indicate that the Pineapple is in the Floating Point **BASIC** language (or has Floating Point **BASIC** "up", as they say) and is ready for instructions.

Another way to boot **DOS** is to type

**PR#6 RETURN**

On your Pineapple. If the controller card is not plugged into slot number six then type

**PR#6 RETURN**

followed by the number of whatever slot the card is plugged into and then **RETURN**.

The System Master is a very special diskette. It contains programs you'll need in order to get the most out of this manual as well as many other useful programs. To see what programs are on the diskette, use the **CATALOG** command. Simply type

**CATALOG RETURN**

and a list of filenames will appear on the screen.

The first program you need is called **COLOR DEMOSOFT**. Locate the name **COLOR DEMOSOFT** in the catalog. Now type

**RUN COLOR DEMOSOFT**

and then press **RETURN**. The screen should look like the photograph on the next page.

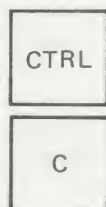
**THE MENU**

Computerniks call this list of numbered descriptions a "menu."

It works like a menu at a roadside cafe. If you want scrambled eggs with hash brown potatoes, toast, jelly and coffee you can just say, "I'll have a number 5." Try selecting one of the color demonstrations by typing its number (followed by a **RETURN**, of course). When you are viewing one of the demos, just press the **RETURN** to get back to the "menu."

## STOPPING THE COMPUTER

To stop the computer, use

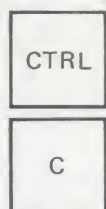


This will cause the prompt character and blinking cursor to appear. The prompt character tells you that it is **OK** to proceed with typing information to the computer. That is why it is called the prompt character: it "prompts" you to type something.

Once the computer is stopped, it may be started again by typing **RUN**

(and, of course, **RETURN**, but you hardly need to be told that anymore. In fact, you won't be from now on.)

Use



to stop the computer, and

**RUN**

to start it again. Try this a few times.

## SETTING THE TV COLOR

If the "menu" is not on your screen, but DOS and **RUN** the program called **COLOR DEMOSOFT** if you are using a disk drive. Or, if you are using a cassette recorder, follow the Usual Procedure for loading the tape marked "**COLOR DEMOSOFT**". One of the items on the menu is called **STANDARD COLOR NAMES**. We will use this **DEMO** to set the TV color. Type the number of the **COLOR NAMES DEMO**, 1, and press **RETURN**. A number of bars of light (perhaps in color) will appear. Under each bar is a four letter abbreviation of a color name. The full names are:

- 0 BLACK
- 1 MAGENTA (a slightly bluish red)
- 2 DARK BLUE
- 3 PURPLE (a light purple, lavender)
- 4 DARK GREEN
- 5 GREY
- 6 MEDIUM BLUE
- 7 LIGHT BLUE
- 8 BROWN
- 9 ORANGE
- 10 GREY
- 11 PINK
- 12 GREEN
- 13 YELLOW
- 14 AQUA
- 15 WHITE

If you have a black-and-white television or monitor, adjust the brightness and contrast until you are pleased. Of course, if the picture is flipping over, stop it the way you would for any TV show. If you have a color set, a bit more work is necessary.

These colors will be different in Europe and some other parts of the world.

Remember that this color business is quite subjective, and that you can do whatever you want with the color. The following instructions will give the picture that we like, using the standard colors. But it's your eyes you must please. Besides, the optimum setting will vary with different amounts of room light.

Turn off any Automatic Color switch. On some sets it is marked "**AUTO COLOR**" or simply "**AUTO**". Turn the **TV** set volume control all the way down (but don't turn the set off). Four controls are now important: Picture, Brightness, Color and Hue. Some sets have a knob marked "Contrast" rather than "Picture," but it does the same thing. Turn the Picture control to its dimmest position, and then turn down the Brightness until the background just goes completely dark. Turn the Color control to the middle of its range. Now turn up the Picture control to make things brighter. Do not make it so bright that the colors "spill" off the edges of the bars too much.

Now adjust the Color knob. At one extreme, all color is lost and the picture is black and white. This setting is handy when you are just showing text on the screen. Adjust the Color control until the colors are intense but not "blooming" or spilling into one another. Lastly, adjust the Hue knob until all the colors agree with their names. Purple, Pink and Yellow are especially sensitive indicators. Also, make sure that the three Blues are distinct.

When the **TV** set's colors are **OK**, press the **RETURN** key and the menu will reappear. Now try **DEMO 2**, which shows the color bars with their code numbers. Also try the other demonstrations. You'll never believe how talented your TV is until you replace the local stations with your Pineapple.



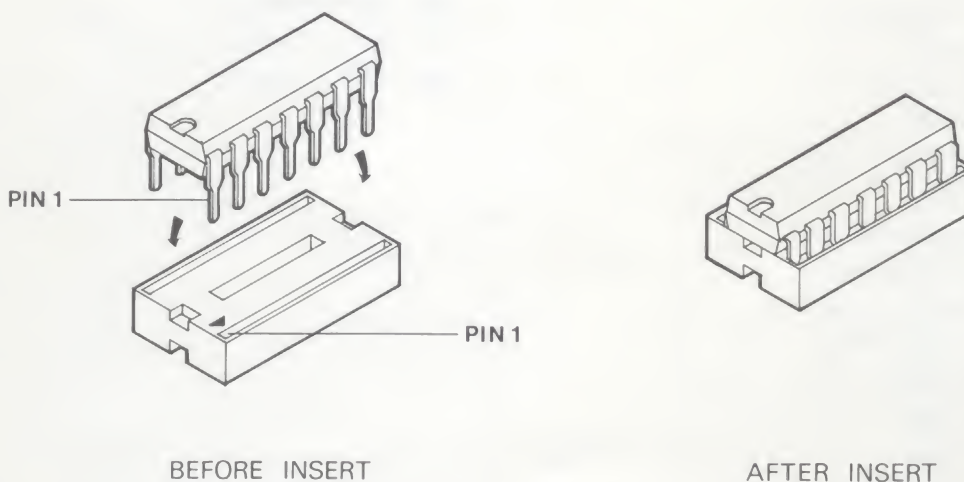


This chapter is written to the KIT buyer. If you are the ASSEMBLE buyer, skip this chapter. If you are the KIT buyer, **READ THIS CHAPTER CAREFULLY.**

It is very important for you if you want to insert any IC chips to the sockets, make sure you get the chips to the right positions. All the part numbers are printed on the board, **READ IT CAREFULLY.**

You will see a little mark on the socket (as figure). It tells you where the position of the pin 1 is. Counting anti-clockwise here from pin 1 to 14 or 1 to 16 etc.

Referring to the IC chips, you will see a segment in only one side, the part number is printed on the surface of the IC chip. This segment is the mark to show you the pin 1 on the IC position (as figure), counting anti-clockwise here from pin 1 to 14 or 1 to 16 etc.



Reviewing to your **Pineapple**, you will see all the IC sockets had been arranged on the board at a same unit. All the pin 1 had been arranged on the bottom of the **left hand side**, except **IC#74 LS 245** (four sockets). These four sockets had been arranged on a special position. The pin 1 are located on the bottom of the right hand side, **CHECK IT CAREFULLY.**

By the way, you will see three **ROM** sockets located on the **G ROM**, they are **IC ROM-D, ROM-E and ROM-F**, make sure the mark of the sockets with the **ROM IC. READ THE LABEL CAREFULLY**, due to the **ROM-D, E, F** and the **CHR. GEN** (located on E-4) are **never** interchanged.

If you are willing to insert the IC chips to the sockets, be careful to put the pins into the socket and let **all** the pins have fine contact. After finished each one, check it **again** carefully. Join it one by one carefully, you should have the good award later. If you invert the IC pins with the sockets, the IC will be burnt immediately.

Make sure to **turn-off** the **Pineapple** before you want to insert or separate the IC chips any time. That would avoid damaging your **Pineapple**.

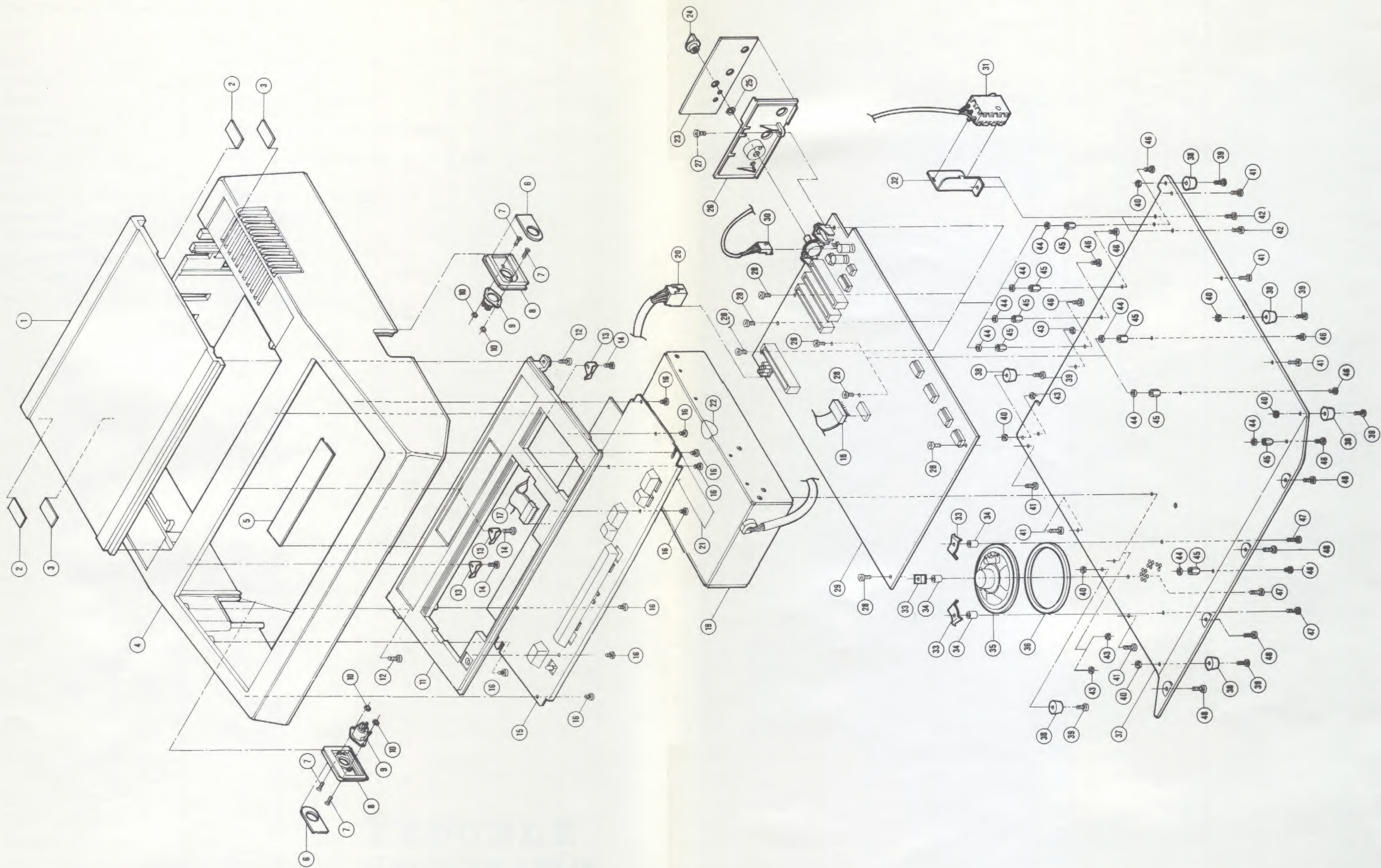
## COMPONENT INSERTION GUIDE

## PART LIST

- |  |  |
|--|--|
| 1. Cover — Top Cabinet                 | 36. Speaker Ring                                   |
| 2. Adhesive Tape (Top Cabinet & Cover) | 37. Plate Bottom                                   |
| 3. Adhesive Tape (Top Cabinet & Cover) | 38. Cushion — Stand                                |
| 4. Cabinet — Top                       | 39. M 3 x 10 BH                                    |
| 5. Plate — Name                        | 40. Nut M 3  |
| 6. Plate — DIN                         | 41. M 3 x 14 BH                                    |
| 7. M 2.6 x 0.45P x 10 KH               | 42. M 3 x 6 BH                                     |
| 8. Cover — DIN                         | 43. Nut M 3  |
| 9. DIN Socket                          | 44. Fibre Washer $\phi$ 3 x $\phi$ 8 x 0.8mm thick |
| 10. Nut M2.6                           | 45. Stud — P.C.B. Mtg.                             |
| 11. Cover — Keyboard                   | 46. M 3 x 5 BH                                     |
| 12. M 3 x 12 BH                        | 47. M 3 x 14 BH                                    |
| 13. Speaker Angle                      | 48. M 3 x 14 BH                                    |
| 14. $\phi$ 3 x 8 BTB                   |  |
| 15. Plate — Control Key                |  |
| 16. M 3 x 6 BH                         |  |
| 17. Keyboard Connector                 |  |
| 18. Keyboard Connector                 |  |
| 19. Power Supply Case                  |  |
| 20. Power Supply Plug                  |  |
| 21. Warning Label                      |  |
| 22. Avoid Label                        |  |
| 23. Plate — Jack                       |  |
| 24. Knob — Volume                      |  |
| 25. Nut M 7                            |  |
| 26. Holder — Jack Plate                |  |
| 27. M 3 x 8 BH                         |  |
| 28. M 3 x 5 BH                         |  |
| 29. Main P.C.B.                        |  |
| 30. Modulator Inlet                    |  |
| 31. Modulator                          |  |
| 32. Bracket — Modulator                |  |
| 33. Speaker Angle                      |  |
| 34. Speaker Collar                     |  |
| 35. Speaker                            |  |

# EXPLODED VIEW







Here are some informations for you if your Pineapple have any problems. Be sure to turn off the Pineapple when you change any parts. It should be avoided to damage the computer. If any questions, please contact the Pineapple service centre, they will be willing to help you anyway.

#### SYMPTON

#### ACTIONS

No Screen

CHECK: Power, D10, E9, Q5

Wrong Display

CHECK: D10, E9, E10

Split Screen

CHECK: C11, C12, C13, C14

Wrong Charactor  
Show On Screen

CHECK: E3, E4, (CHARACTER GEN.)

Can't Syntax

CHECK: Jumper Pad A13, B11, B12, B13, B14

Color Mod.

CHECK: A1

Can't Display

CHECK: D12, D13, G8, G9

No Cassette Out

CHECK: G8, H12

Can't Read Cassette

CHECK: G8, G12, J12

Some Slot, No Function

CHECK: F2, F12

No Master Reset

CHECK: E12, E13, Q5

No Cursor

CHECK: D3, D11, D13

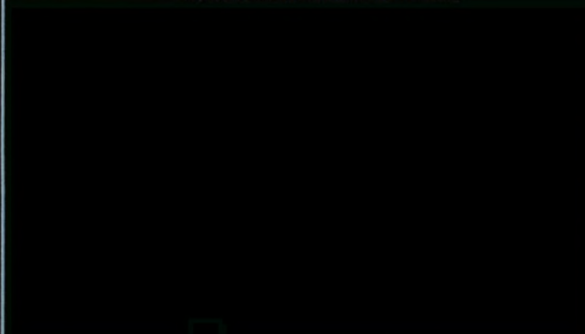
## **TROUBLE SHOOTING**

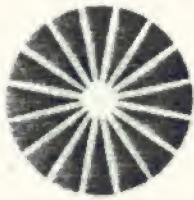
---

**PINEAPPLE**  
PERSONAL COMPUTER



**PINEAPPLE**  
PERSONAL COMPUTER





## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250

213-679-5162 973-1921 TWX 910325 7151

### \*\*\*\*\* THE PINEAPPLE COMPUTER KIT\*\*\* ASSEMBLY NOTES

Before you start to assemble this kit, read the wiring, soldering, and step-by-step assembly information carefully.

Read the entire step before you perform the operation; then follow the instruction carefully. Position all parts as shown in the P.C. Board.

Install the components on the component side (screened) of the circuit board and solder the leads to the other side. Resistors are designated by their resistance value in Ohms, Kilohms, or Megohms and color code. Capacitors will be designated by their capacitance value (in pF and uF) and type (disc, monolythic or electrolytic). Position electrolytic capacitors only as shown.

Due to the small foil area around the circuit board holes and the small areas between foils, use the utmost care to prevent solder bridges between adjacent foil areas. Use only a minimum amount of solder and use no larger than a 40-watt soldering iron with a pencil tip. Allow it to reach operating temperature, and then apply it only long enough to make a good solder connection.

Wipe the soldering iron tip often on a damp cloth or sponge. It is good habit to wipe the iron each time you solder a group of connections. The soldering iron tip must be clean of oxidation and have a bright thin solder coat.

SAFETY WARNING: Avoid eye injury when you cut off excess lead lengths. Hold the leads so they cannot fly toward your eyes.

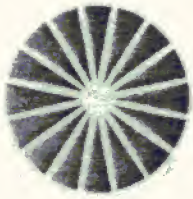
#### \* \* \* IMPORTANT NOTICE \* \* \*

IT IS ADVISABLE TO GO THROUGH THE ASSEMBLY INSTRUCTIONS THOROUGHLY BEFORE YOU DO ANYTHING. IF YOU ARE NOT CONFIDENT ENOUGH TO ASSEMBLE THIS KIT, DON'T DO IT! HAVE IT DONE BY AN EXPERIENCE TECHNICIAN, OR CONTACT US FOR ASSISTANCE.

If you have any questions, please call our information hotline during business hours at (213) 973-7156 Monday thru Friday.

HAPPY ASSEMBLING!





# FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250

213-679-5162 973-1921 TWX 910325 7151

## THE PINEAPPLE COMPUTER KIT \*\*\*\*\*

### ASSEMBLY INSTRUCTION

#### THE MOTHER BOARD

Locations of all components are already silk-screened on the component side of the motherboard. Just place the components into the right place and solder them onto the other side. The values of all the components should be marked on the P.C. Board, e.g. 100 x 4 means 100-Ohm resistors x 4 pieces. The followings are interpretations for some of the part numbers screened on the motherboard:

I.C. 8197	=	74LS367	Resistor Values:
I.C. 251	=	74LS251	27 = 27 Ohms
I.C. 558	=	NE558N	4.7K = 4,700-Ohms
I.C. 555	=	NE555P or LM555	
I.C. 741	=	UA741CP or LM741N	

We suggest you to use a fine tip (30 watt) soldering iron together with 40/60 resine cored solder. Never solder I.C. directly on to the P.C. board. Always use I.C. sockets. When putting in the IC sockets, make sure they are properly oriented. After you finished one row, tape them down with a long piece of scotch tape. Flip the board over and apply solder to pins 1 and 14(16). Make sure the sockets are seated properly on the board before you go onto the other row. After you have finished with all the rows, you can solder them permanently to the mother board. Follow the following steps to make your assembly easier:

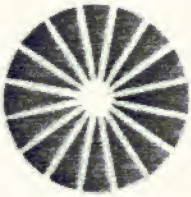
- ( ) I.C. sockets first, put them in by the row.
- ( ) All other components including resistors, capacitors, headers, crystal, transistors, trimmer resistor and trimmer capacitors. The 44 pcs. 1uF caps should go to locations with a capacitor symbol ( ) only.
- ( ) The edge connectors. Proper orientation required.
- ( ) The 10K-100K volume control and the RCA jack.

After you have finished, double check for solder bridges, cold solder joints and missed solder joints.

#### ICs

Before you plug in the ICs, check the resistance values of all the power supply lines with respect to ground. If you have a reading of less than 300-Ohms on anyone of the lines, check your circuit again.





## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250

213-679-5162

973-1921

TWX

910325

7151

### ASSEMBLY INSTRUCTIONS

#### THE POWER SUPPLY

The power supply is already mounted on the bottom plate of the case. However the output connector may be different from that of the motherboard's. A set of wires terminated with a compatible connector is supplied. If your powersupply comes with a different connector, splice the wires together with the correct connector according to the voltage information on the power supply and the mother board. Figure B shows the power connector on the motherboard. (Note: Color code on power supply may be different than that of the connector wire.)

#### MOUNTING THE MOTHERBOARD

Refer to Figure(A,) the motherboard and the base plate should be positioned as shown. The front side of the base plate and the "RAM" side of the motherboard should be placed towards you.

On the motherboard, there are 7 mounting holes with diameter approx. 4mm. Refer to Fig. A for the locations of the mounting holes. If wrong holes were used, permanent damage to the motherboard will result.

To locate the mounting holes on the bottom plate, place the motherboard right next to the power supply. By moving the motherboard back and forth, you should be able to align the mounting holes on the base plate with those on the motherboard.

Affix one(1) machine screw (3mm x 20mm) to the top right hand corner (mounting hole next to the R.F. modulator) with one(1) threaded hex brass stand-off (5mm x 6mm).

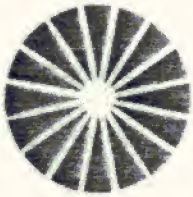
By using six(6) threaded brass stand-offs (5mm x 6mm), affix six (6) machine screws (3mm x 14mm) to the rest of the mounting holes.

Put a fiber washer (red color) on top of each brass stand-off before you mount the motherboard. This step is very important. Failure to do so will cause serious damages to the motherboard. See Figure 'C' for illustration.

#### MOUNTING THE BACK PANEL

The back output panel should be mounted to the volume control with a washer and a nut. Cover the panel with the self-adhesive silk screened terminal plate. It then attached to the motherboard by securing it to the longer mounting screw next to the R.F. modulator with a hex nut. Secure the motherboard to the bottom plate by using another six(6) hex nuts and six(6) red fiber washers.





## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250

213-679-5162 973-1921 TWX 910325 7151

### ASSEMBLY INSTRUCTIONS (CONT'D)

#### R.F. MODULATOR

The R.F. Modulator unit (Optional) is preset to Channel 3 output. A wire comes out of the modulator with a connector at the end. Plug it into a 4-pin header behind the Video output RCA jack and you are done with it.

#### THE SPEAKER

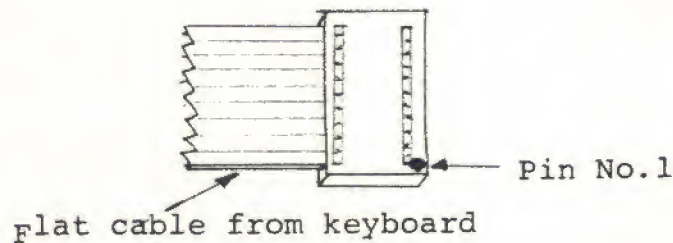
The speaker should be factory mounted to the base plate. Just solder the speaker wire to the speaker and plug-in to the mother board where it says SP next to the audio amplifier I.C. ULN22838.

#### SIDE GAME JACKS

Mount one Pin-Jack to each one of the small side-panels by using two(2) 3mm x 10mm taper head machine screws. Cover it with a self-adhesive silk-screened plate. Slide it into the upper case. Right hand side to the right side and vis-versa. These two jacks are for future expansion, and are not used for the time being.

#### FINAL STEP ( THE KEYBOARD )

Place the upper case on top of the bottom plate, plug the keyboard cable to the socket labeled 'keyboard' on the mother-board and you are ready to fire up your computer.





# **FORMULA INTERNATIONAL INC.**

12803 CRENSHAW BLVD. • HAWTHORNE, CA 90250  
 213-679-5162 973-1921 TWX 910325 7151

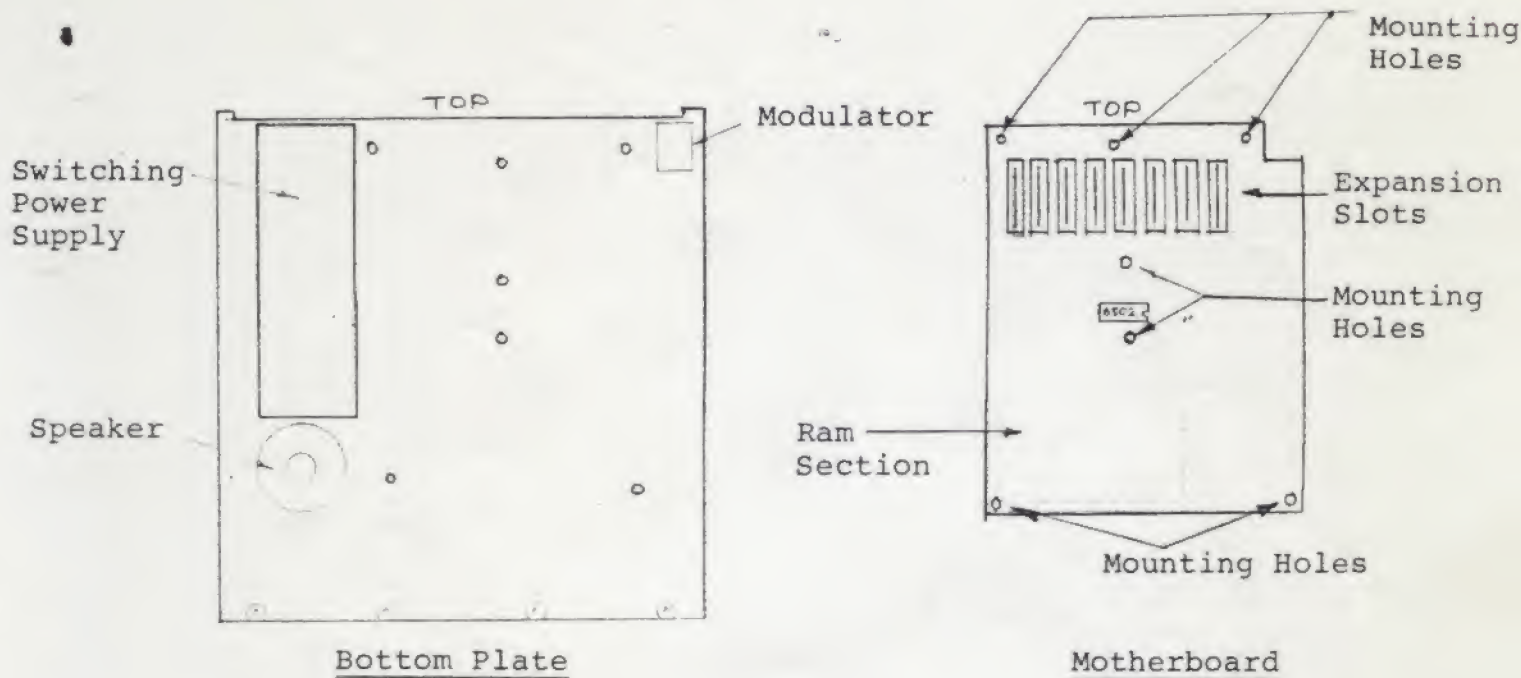
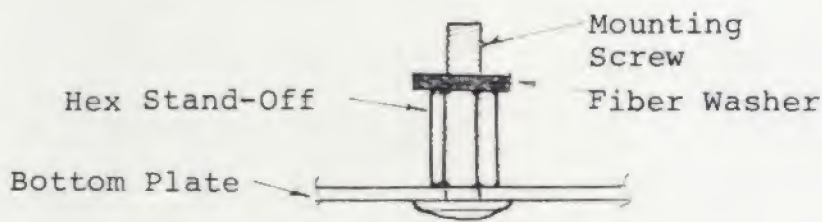
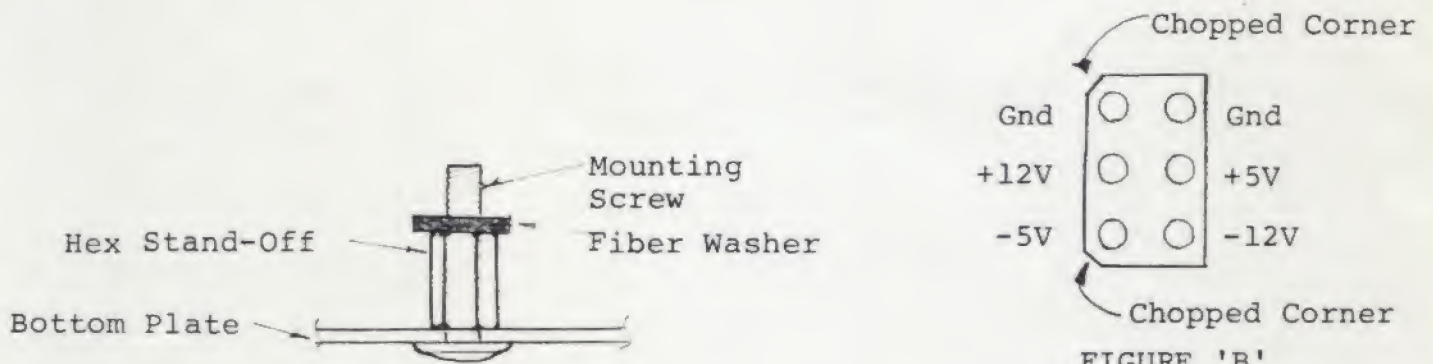
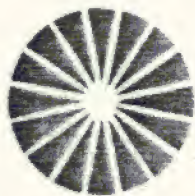


FIGURE 'A'







## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250

213-679-5162 873-1921 TWX 910325 7151

### PARTS LIST

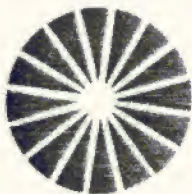
Check all the parts against the following list for shortage. If a shortage is found, contact your supplier immediately for action. A space is provided for your convenience. Put a check mark there each time that component checks out correct.

#### RESISTORS

( )	10-0hm	(Brown-Black-Black)	1ea. ✓
( )	27-0hm	(Red-Purple-Black)	1ea. ✓
( )	100-0hm	(Brown-Black-Brown)	5ea. ✓
( )	200-0hm (220-0hm)	(Red-Black-Brown)	2ea. ✓
( )	1K-0hm	(Brown-Black-Red)	3ea. ✓
( )	1.5K-0hm	(Brown-Green-Red)	1ea. ✓
( )	2K-0hm	(Red-Black-Red)	1ea. ✓
( )	2.7K-0hm	(Red-Purple-Red)	1ea. ✓
( )	4.7K-0hm	(Yellow-Purple-Red)	2ea. ✓
( )	10K-0hm	(Brown-Black-Orange)	1ea. ✓
( )	12K-0hm	(Brown-Red-Orange)	6ea. ✓
( )	2.2M	(Red-Red-Green)	1ea.
( )	3.3M	(Orange-Orange-Green)	1ea. ✓
( )	1K-0hm Sip Resistor pack (Black color)		3ea. ✓
( )	200-0hm Trimmer Resistor		1ea. ✓

#### CAPACTORS

( )	47pF	Monolythic	1ea. ✓
( )	.001uF (1000pF)	Monolythic	2ea. ✓
( )	.02UF	Polythene	4ea. ✓
( )	.1uF	Monolythic	44ea. ✓
( )	470uF or 500uF	electrolytic	2ea. ✓
( )	5 - 50pF	Trimmer Capacitor	2ea. ✓



## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250  
213-679-5182

### I.C. SOCKETS

- ( ) 8-pin
- ( ) 14-pin
- ( ) 16-pin
- ( ) 20-pin
- ( ) 24-pin
- ( ) 40-pin
- ( ) 50-pin Peripheral Connector

4ea.

17ea. 16

57ea. ✓

2ea. ✓

4ea. ✓

1ea. ✓

8ea. ✓

### INTEGRATED CIRCUITS

- ( ) 74LS00
- ( ) 74LS02
- ( ) 74LS04
- ( ) 74LS08
- ( ) 74LS11
- ( ) 74LS20
- ( ) 74LS32
- ( ) 74LS51
- ( ) 74LS74
- ( ) 74S86
- ( ) 74LS138
- ( ) 74LS139
- ( ) 74LS151
- ( ) 74LS153
- ( ) 74LS161
- ( ) 74LS166
- ( ) 74S175
- ( ) 74LS194
- ( ) 74LS195
- ( ) 74LS245
- ( ) 74LS251

1ea.

3ea.

2ea.

2ea.

1ea.

1ea.

1ea.

1ea.

4ea.

1ea.

3ea.

1ea.

1ea.

4ea.

4ea.

1ea.

1ea.

3ea.

1ea.

1ea.

1ea.



## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250  
213-679-5162

### INTEGRATED CIRCUITS (CONT'D)

( ) 74LS257	5ea.
( ) 74LS259	1ea.
( ) 74LS273	1ea.
( ) 74LS283	1ea.
( ) 74LS367 (8T97)	3ea.
( ) NE555	2ea.
( ) NE558	1ea.
( ) uA741	1ea.
( ) ULN2283B	1ea.
( ) 6502(A)	1ea.
( ) ROM - D	1ea.
( ) ROM - E	1ea.
( ) ROM - F	1ea.
( ) ROM - G	1ea.

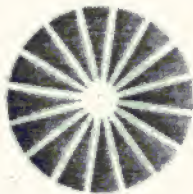
### CRYSTAL AND TRANSISTORS

( ) Crystal 14.318Mhz (XTAL on Motherboard)	1ea.
( ) Transistor - 9018 (2N3902, 2N3904)	3ea.

### CASE AND ACCESSORIES

( ) Pineapple Case with Keyboard	1ea.
( ) Rear Plate with label	1ea.
( ) Switching Power Supply (Mounted in Case)	1ea.
( ) 3-prong line cord	1ea.





## FORMULA INTERNATIONAL INC.

12603 CRENSHAW BLVD. • HAWTHORNE, CA 90250  
213-679-5162

### MISC

( ) Variable Resistor, 10K - 100K	1ea.
( ) Nut & Washer	1ea.
( ) Knob	1ea.
( ) Mini Phone Jack	2ea.
( ) P.C. Mount RCA Jack	1ea.
( ) Speaker Wire with connector	1ea.
( ) 27uH Choke Coil Grey Color	1ea.
( ) 6-pin Power Connector (Header)	1ea.
( ) 4-pin Header	1ea.
( ) 2-pin Header	1ea.

### HARDWARE

( ) Brass Stand-Offs (5mm x 6mm)	7ea.
( ) Machine Screws (3mm x 14mm)	6ea.
( ) Machine Screws (3mm x 16mm)	1ea.
( ) Machine Screws (3mm x 10mm)	10ea.
( ) Nuts (3mm)	7ea.
( ) Fiber Washer	14ea.

NOTE: Misprint on Motherboard:

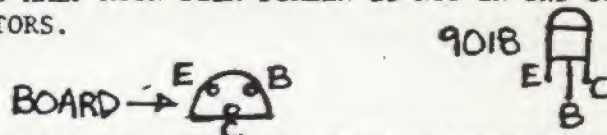
Resistor next to I.C. 741 marked 4.7k or 470 on P.C. Board should be 470K-0hm. Cassette interface will not operate if you use 4.7K resistor.

## IMPORTANT

### ASSEMBLY NOTES

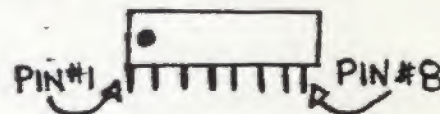
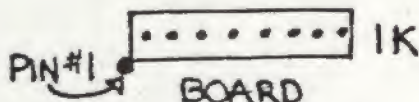
#### TRANSISTORS:

ON THE P.C. BOARD FOR THE PINEAPPLE THERE ARE LOCATIONS FOR THREE TRANSISTORS MARKED 2N3904. THE TRANSISTORS THAT COME WITH THE KIT ARE 9018. MAKE SURE WHEN YOU SOLDER IN THE 9018 TRANSISTORS THAT THE EMITTER, BASE, AND COLLECTOR GO TO "E", "B", AND "C" ON THE P.C. BOARD. THE HALF MOON SILK SCREEN IS NOT IN THE CORRECT POSITION FOR THE 9018 TRANSISTORS.



THE CORRECT POSITION FOR THE 9018 TRANSISTOR IS AT AN ANGLE TO THE SILK-SCREEN.

#### 1K SIP RESISTOR



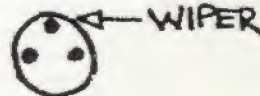
MAKE SURE THAT THE DOT OR PIN #1 GOES TO THE DOT ON THE P.C. BOARD. IF THE SIP IS NOT INSTALLED CORRECTLY, THE PINEAPPLE WILL NOT OPERATE PROPERLY. SOME KITS MAY HAVE SIPs THAT ARE OVER 8 PINS LONG. AS THE KIT USES ONLY 8 PINS CUT OFF PIN#9 AND PIN#10. IF APPLICABLE.

#### 27uH INDUCTOR

THIS IS A SMALL GREY PART WITH A BLACK TOP AND LONG LEADS. INSTALL IT IN THE LOCATION MARKED '27uH'. IT DOES'NT MATTER WHICH WAY IT GOES IN AS ITS NOT POLARIZED.

#### 200 OHM POT

VR-200, INSTALL THE POT WITH THE WIPER GOING TO THE 27 OHM RESISTOR. THE WIPER IS THE MIDDLE PIN LOOKING AT THE BOTTOM OF THE POT.



#### .001uF, 1000pF CAPACITORS

THE P.C. BOARD IS MARKED IN ONE PLACE .001uF AND IN ANOTHER PLACE 1000pF. IN BOTH THESE PLACES INSTALL A "102" CAPACITOR.

#### COLOR ADJUSTMENT

TURN THE VARIABLE CAPACITOR NEAR THE XTAL.





# FORMULA INTERNATIONAL INC.

12603 Crenshaw Blvd., Hawthorne, CA 90250

For information (213) 973-1921 • Orders Only (outside Calif.) (800) 672-8758



## pineapple™

**The Alternative! The Compatible!  
The Affordable! 48K Color Computer Kit!**

### FEATURES:

- ★ Fully compatible with Apple® II+
- ★ Singleboard for easy assembly
- ★ Popular 6502 MPU for large amount of software
- ★ Game paddle connector on both sides of case
- ★ Built in 2-watt amplifier for realistic sound effect with volume control
- ★ 8 on board peripheral connectors for expansion
- ★ 14 key numeric key-pad
- ★ 5-amp switching power supply

**\$645<sup>00</sup>**  
EACH

(please add 5% shipping and handling)

Easy to assemble! All components are clearly silk-screened on the high quality double-sided mother board. All integrated circuits, IC sockets, peripheral connectors, keyboard, switching power supply and the professional high impact plastic case are included.

**NEW**

### High Quality 16K RAM Card Kit

(no cable required)

Same feature as the one we've been selling but without the mess of Dip-wire for Apple® & Pineapple™.

**\$59.95** per kit

### 5 1/4" Flexible Disc Sale

Why buy other brands when you can buy WABASH discs for much less and backed by 1-year factory warranty.

All discs come with Hub Rings

M13A411X	5 1/4" SSDD Soft Sector	\$2.25	} 10-99
M43A411X	5 1/4" SSDD 10 Hard Sector	\$2.25	
M53A411X	5 1/4" SSDD 16 Hard Sector	\$2.25	
M14A411X	5 1/4" DSDD Soft Sector	\$3.65	
F111111X	8" SSDD IBM compatible	\$2.45	
F131211X	8" SSDD 26 sectors 128 bytes	\$3.05	

### At last! Here's the computer case everyone has been looking for!

Ideal for your homebrew

\*AP-II 6502 MPU based computer.

Made with high impact plastic.

Color and shape are compatible

with the standard Apple II

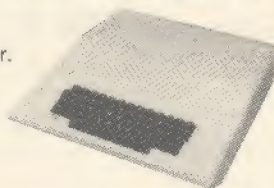
computers.

Introductory Offer

**\$150.00** ea.

Keyboard not included see our Ad in this page.

MODEL: AP-II

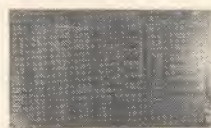


\*AP-II model is compatible with Apple II but not manufactured by Apple Computers, Inc. \*Apple or Apple II is a registered trademark of Apple Computers, Inc.

### 6502 MPU Based Computer Motherboard!

**You ask for it, you got it!**

- ★ 48K on board memory (4116)
- ★ 12K on board EPROM memory (2716 or 2732)
- ★ 8 expansion slots for peripheral cards
- ★ Composite-video output
- ★ size: 14 1/4" x 8 1/2"



**\$99.95** ea.

### 16K RAM Card Kit For Your Apple® & Pineapple™ Computer

Kit includes:

- High Quality P.C. Board • 8 ea. 4116 (200ns) • All the IC's & parts • 16-pin Dip wire • Easy to assemble. You can do it in less than 30 minutes!

**\$49.95** per kit



### 5 1/4" Disc Drive 100% Apple® & Pineapple™ Compatible

We did it once, response was great! Now we are doing it again, don't miss it!

**\$295.00** ea. w/o controller

**\$385.00** ea w/controller



### Replacement Keyboard For Your Apple® II Computer

Got a bad Keyboard? Here's the alternative!

- ★ Full ASCII code
- ★ N-key rollover function
- ★ TTL level output
- ★ On-Off indicator
- ★ Low power consumption
- ★ With upper/lower case function

**\$99.95** ea.



### Switching Power Supply For Apple®, AP-II, and Pineapple Computer

Compact size switching power supply.

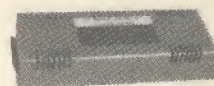
Specification:	4006A	4007A
+5V at	3A	5A
-5V at	2A	3A
+12V at	.5A	1A
-12V at	.5A	1A

4006A ..... **\$99.00** ea.

4007A ..... **\$145.00** ea.

Size: Width 3 1/2", Depth 9 1/4", Height 2 1/4"

Size and mounting holes will be same as the one used in Apple II.



\* Apple is a registered trademark of APPLE COMPUTERS, INC.

SHIPPING AND HANDLING CHARGES	
Under \$50.00 Purchase	Over \$50.00 Purchase
10%	5%
15%	10%
25%	20%

Inside California  
Outside Calif. (Incl. Mexico & Canada)  
Overseas

Minimum Order \$10.00 / Calif. Residents add 6.5% Sales Tax. Phone Orders Accepted on VISA or MC ONLY. NO C.O.D.'s. Prices subject to change without notice.



**STORE HOURS**  
MON-FRI — 10-7  
SAT — 10-6

Circle 174 on Inquiry card.



**Tel 5-421328**



## DISK DRIVES

**SPECIFICATIONS:**

- 256 BYTES/SECTOR
- 16 SECTORS
- 35/40 TRACKS
- 143K DISK
- 250K BPS TRANSFER SPEED

- POWER CONSUMPTION  
+5V DC, 50mA +12V DC, 300mA  
One Phase on 450mA
- COMPLETE WITH CASE AND CABLE
- DIMENSIONS  
CABINET 4" x 6.2" x 8.7"  
3.75" (H) x 6.1" (W) x 8.25" (D)
- WEIGHT NET 1.7g



*Starcomp Company*

Shop No 52, 1/F., Golden Shopping Centre,  
Fuk Wah Street, Sham Shui Po, Kowloon, Hong Kong.  
Tel: 3-869738 3-619134 Tlx: 51033 SCOMP HX

## Spread Sheet

**Configuration: WANG VS series**

**Name of package:** PHIMOD — Financial Modeling Package.

**Applications:** Financial planning, forecasting, budgeting, profit and cash planning, investment return analysis etc.

**Features:** Multi-user, electronic worksheet, horizontal/vertical scrolling, on-line calculation and display, functional key command instructions, immediate hard copy print option.

**Supplier:**  
**MANAGEMENT DATA SYSTEMS LTD.**  
20th Floor, Malaysia Building,  
47-50 Gloucester Road, Hong Kong.  
Tel: 5-274582-3 Tlx: 63158 HX.



pineapple™

**PERSONAL COMPUTER SYSTEM  
THE NAME YOU SHOULD REMEMBER**

— ASK FOR DETAILS —  
**Pineapple Computer Products (HK) Ltd.**  
 RM 11, PINNACLE CENTRE, MOODY RD., EAST TSIM SHA TSUI, EAST KOWLOON, H.K.  
 Phone: 1-702-7411, 1-702-7412      Telex: 93000-0000 H.K.

## COMPUTER RIBBON



- \* Anadex
- \* IBM
- \* NCR
- \* NEC
- \* Burroughs
- \* Centronics
- \* Digital
- \* Wang

**AND MORE...**

Please call

## INTERNATIONAL BUSINESS COMPUTER

Flat 19, 10/FI., Profit Ind. Bldg.,  
1-15 Kwai Fung Crescent, Kwai Chung  
Hong Kong.

Tel: 0-234425 Tlx: 51469 IBCHK HX



**wabash®**

**When it comes to  
Flexible Disks, nobody  
does it better than  
Wabash.**

Active Enterprises Co. 惠達企業公司

342-344, Kwun Tong Road, 4/FI., Chuan Yuan Factory Bldg. Kwun Tong, Kowloon, Hong Kong.

Tel: 3-7554980 3-7577889 Telex: 40291 KPLIN HX Cable: LINKINPING



## Industry Report

# Precedent-setting injunction halts sales of Apple-clone

By Kathy Chin, IW Staff

If judges begin to interpret the federal copyright law like Judge Irving Hill did, then companies copying the technology of other computer manufacturers are in trouble.

In a precedent-setting case and as a result of a recent preliminary injunction, the U.S. District Court for the Central District of California has ordered Formula International, a Los Angeles distributor, to halt sales of the Pineapple, a build-it-yourself, Apple-clone computer.

Apple Computer, located in Cupertino, California, considers the ruling a landmark decision, since many court judgments have been unclear on the issue of computer copyright laws.

Judge Hill concluded that the copyright law includes programs stored in a computer's ROM, whether they are in source or object code. According to Hill, Formula International had ille-

gally duplicated Applesoft, DOS 3.3, Integer BASIC and Autostart ROM programs, which were embodied in the ROM and diskettes.

The company's chief computer product had been the Pineapple, an 8-bit 6502-based micro with 48K memory, manufactured in Hong Kong. Unassembled it sold for \$645; together with keyboard, casing, motherboard and power supply, the product cost \$695.

Formula International is not only charged with violating copyright; the firm faces patent and trademark charges as well.

Formula International is appealing

the injunction and is hoping to keep its original product name. "After all, apples and pineapples are two different kinds of fruit," said Alex Leung, president of the Hawthorne, California, company.

Leung said that he had to cancel over \$150,000 worth of magazine ads.

On the day the firm received the preliminary injunction, company officials changed the name Pineapple to Pinecom and began selling the \$645 product with Formula's own ROM.

Leung said that Formula International previously had no alternative but to use the Apple ROM in their computer, in order to have Apple II Plus

compatibility. "Now we have developed our own operating system," he said.

According to Leung, in three months time, the company will be marketing its newest computer, the Formula II. It will cost \$850 and is an IBM PC look-alike that runs Apple II Plus software. Leung stressed that the micro will include Formula International's own operating system.

"The Far East has produced a proliferation of counterfeit products," said Apple spokesman Stan DeVaughn. "Apple will aggressively pursue every effort to stop companies which pur-

**See Pineapple, page 21**

## Pineapple

*continued from preceding page*  
port to run our software."

Apple is also awaiting a decision from another infringement-of-copyright lawsuit filed one year ago against Franklin Computers in Cherry Hill, New Jersey, for copying Apple's software in the form of diskettes and ROM components.

The Third Circuit Court of Appeals in Philadelphia, Pennsylvania, could not determine the intent of the computer-software protection clause granted by U.S. copyright laws.

Apple Computer hopes that Hill's ruling will initiate some action on the Franklin suit. "At this point, we just don't know," said DeVaughn. ■

## Your CP/M & Hardware Source

4

CP/M-80

LIST SALE

Despool ..... 50 38  
Display Manager ... 400 295

Mark of The Unicorn  
Final Word ..... 300 223

Sales Inv. .... 750 515  
Peachpak Series 9 ... 500 345

Ada Compiler ..... 300 225  
Analiza II ..... 50 38

C Compiler ..... 250 188



OPERATION  
MANUAL

pineapple

pineapple™

PERSONAL  
COMPUTER

pineapple™

